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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/671,715	09/27/2000	Anatoly Fabrikant	M-10699 US	6087
36257	7590	12/15/2003	EXAMINER	
PARSONS HSUE & DE RUNTZ LLP 655 MONTGOMERY STREET SUITE 1800 SAN FRANCISCO, CA 94111			SMITH, ZANDRA V	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 12/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/671,715	FABRIKANT ET AL.	
Examiner	Art Unit		
Zandra V. Smith	2877		

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

**THE MAILING DATE OF THIS COMMUNICATION:**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any  
corresponding patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on \_\_\_\_.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-117 is/are pending in the application.  
4a) Of the above claim(s) 31-35, 59-61, 84-86 and 109-111 is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 1-5, 7-10, 13-22, 25-30, 36-37, 39-40, 42-43, 46-53, 56-58, 62-65, 66, 68-69, 72-79, 82-83, 87-94, 97, 99-104, 106-108, and 112-117 is/are rejected.  
7)  Claim(s) 6, 11, 12, 23, 24, 38, 41, 44, 45, 54, 55, 67, 70, 71, 80, 81, 95, 96, 98 and 105 is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

13)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a)  The translation of the foreign language provisional application has been received.

14)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)      4)  Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_ .  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948) *Q1, Q2, Q3*      5)  Notice of Informal Patent Application (PTO-152)  
3)  Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5-1-01*      6)  Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

Claims 31-35, 59-61, 84-86, and 109-111 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention there being no allowable generic or linking claim. Election was made **without** traverse.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-3, 5, 7-10, 13-22, 25-30, 36-37, 40, 42-43, 46-53, 56-58, 62-64, 66, 68-69, 72-79, 82-83, 87-89, 91-94, 97-104, 106-108, and 112-117 rejected under 35 U.S.C. 102(e) as being anticipated by *Conrad et al. (5,963,329)*.

As to claims 1, 21, and 27, Conrad discloses a system for measuring the profile of small repeating lines, comprising:

directing a beam of polychromatic light at a diffractive structure and detecting corresponding intensities or changes in polarization state of the diffracted beam at a number of wavelengths; carrying out a measurement of the structure to obtain measured intensities or changes in polarization state; providing one or more sets of intensity or changes in polarization state data of the diffraction at different wavelengths; and deriving the value of one or more parameters of the diffracting structure from the measured intensity or changes in polarization state (col. 4, lines 8-15, lines 28-56, and col. 8, lines 1-15).

As to claims 2-3, Conrad discloses everything claimed, as applied above, in addition a library is generated of the intensity or change in polarization state data and the intensities or changes in polarization state are compared to the one or more parameters (col. 11, lines 40-46 and col. 4, lines 30-50).

As to claim 5, Conrad discloses everything claimed, as applied above, in addition the step of choosing a first set of values of one or more parameters as a function of sensitivity of the intensity or change in polarization state is provided (col. 5, lines 28-47).

As to claims 7, 25, and 29, Conrad discloses everything claimed, as applied above, in addition the method is used in controlling a manufacturing parameter (col. 5, lines 28-57).

As to claims 8, 26, and 30, Conrad discloses everything claimed, as applied above, in addition the method is used in semiconductor manufacture (col. 4, lines 20-21).

As to claim 9, Conrad discloses a system for measuring the profile of small repeating lines, comprising:

directing a beam of polychromatic light at a diffractive structure and detecting corresponding intensities or changes in polarization state of the diffracted beam at a number of wavelengths; providing a model to approximate the structures, the model including calculation of eigenvalues; storing the eigenvalues; carrying out a measurement of the structure to obtain measured intensities or changes in polarization state of a diffractive structure; and employing eigenvalues to obtain the value of one or more parameters of the diffracting structure (col. 9, lines 9-45, col. 4, lines 30-50).

Regarding claim 10, Conrad discloses everything claimed, as applied above, in addition the diffractive structure comprises layers (col. 5, lines 30-35).

Regarding claims 13-18, Conrad discloses everything claimed, as applied above, in addition a plurality of layers as a multi-layer model including propagation of an S-matrix in the layers of the structures and storing the S-matrix (col. 6, lines 6-30).

As to claims 19-20, Conrad discloses everything claimed, as applied above, in addition the method is used in controlling a semiconductor manufacturing parameter and value supply to a stepper or etcher (col. 5, lines 28-57 and col. 4, lines 20-21).

As to claim 22, Conrad discloses everything claimed, as applied above, in addition the wavelengths are chosen to reduce the influence of properties of the layers (col. 8, lines 15-35).

As to claim 28, Conrad discloses everything claimed, as applied above, in addition a higher density of intensity or change in polarization state data is taken at wavelengths where the data is more sensitive to changes in wavelength (col. 8, lines 15-35).

As to claims 36, 42, 52, 56, and 58, Conrad discloses a system for measuring the profile of small repeating lines, comprising:

an apparatus for directing a beam of polychromatic light at a diffractive structure and detecting corresponding intensities or changes in polarization state of the diffracted beam at a number of wavelengths;

a data source that supplies a library of sets of intensity or change in polarization state data of the diffraction at the wavelengths; and

a processor providing a set of intensity or change in polarization state data and performing optimized estimation within a neighborhood of the set of intensity or change in polarization state data (col. 7, line 60-col. 8, line 14 and col. 5, lines 38-50).

As to claims 37, 53, and 57, Conrad discloses everything claimed, as applied above, in addition a higher density of intensity or change in polarization state data is taken at wavelengths where the data is more sensitive to changes in wavelength (col. 8, lines 15-35 and col. 11, lines 40-46).

Regarding claim 40, Conrad discloses everything claimed, as applied above, in addition the processor chooses a first set of parameters (col. 5, lines 28-47).

Regarding claim 43, Conrad discloses everything claimed, as applied above, in addition the diffractive structure comprises layers of different material (col. 4, lines 35-40).

Regarding claims 46-51, Conrad discloses everything claimed, as applied above, in addition a plurality of layers as a multi-layer model including propagation of an S-Matrix in the layers of the structures and storing the S-Matrix (col. 6, lines 6-30).

As to claims 62-64, 66, 68-69, 72-79, 81-83, 87-89, 91-94, 97-104, 106-108, and 112-117, these correspond as the computer program and a system for transmitting the program to perform a method, these claims correspond to claims 1, 9, 21, 27, 36, 42, 52, 56, and 58, and since the computer is programmed to perform the method as claimed (col. 5, lines 38-42), the limitations are inherently met.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2877

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 39, 65, and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over

*Conrad et al. (5,963,329)*.

As to claims 4, 39, 65, and 90 Conrad discloses everything claimed, as applied above, with the exception of performing a non-linear regression, however since this amounts to the use of a different or preferred method of data analysis, it would have been obvious to one having ordinary skill in the art at the time of invention to perform a non-linear regression.

#### *Allowable Subject Matter*

Claims 6, 11-12, 23-24, 38, 41, 44-45, 54-55, 67, 70-71, 80-81, 95-96, 98, and 105 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record, taken alone or in combination, fails to disclose or render obvious choosing a first set of parameters as a function of system noise, a multi-modal method, wavelengths chosen such that the one or more layers are opaque to the wavelengths, or forming an array of rectangular blocks for each slab and performing multi-modal analysis on each array, in combination with the rest of the limitations of claims.

*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Finarov et al. (6,657,736)

*Fax/Telephone*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zandra V. Smith whose telephone number is (703) 305-7776. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (703)308-4881. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0530.



Zandra V. Smith  
Primary Examiner  
Art Unit 2877

December 5, 2003